

Table XIV

Test station				Firing area		
Propulsion and electrical console	Stabilizer and steering console	Range console	Lateral and program console	Firing section	Servicing section	
					Electrical and pneumatic	Handling and fueling
ALCOHOL LOADING	VERTICAL CONTROL SYSTEM TEST AND STABILIZER PRE-SETTINGS	VERTICAL RANGE COMPUTER TEST	VERTICAL LATERAL COMPUTER TEST	ALCOHOL LOADING	ALCOHOL LOADING	HAVE FIRE FIGHTING EQUIPMENT AND PERSONNEL IN THE AREA READY FOR EMERGENCY ACTION. ALCOHOL LOADING IS PERFORMED AS SOON AS THE INERT LEAD HAS BEEN LOADED. LOX AND HYDROGEN PEROXIDE LOADING MAY BE PERFORMED CONCURRENTLY AFTER THE ALCOHOL LOADING OPERATION IS COMPLETED.
	<p>BEFORE STARTING THIS TEST, THE MISSILE MUST BE LAYED WITHIN <math>\pm 1</math> DEGREE OF FIRING AZIMUTH.</p> <p>ALL STEPS AND INDICATIONS ARE ON THE STABILIZER CONTROL PANEL UNLESS OTHERWISE NOTED.</p> <p>1. Insure that the Operation Selector switch is in the Test position.</p> <p>2. Verify normal indications.</p> <p>a. Indicator H (Attitude Signals) lamp On.</p> <p>b. Program zero lamp On.</p> <p>c. Air Pressure Supply lamp On.</p> <p>d. Air Pressure Platform lamp On.</p> <p>e. Temperature meter deflects.</p>	<p>ALL STEPS AND INDICATIONS ARE ON THE RANGE CONTROL PANEL UNLESS OTHERWISE NOTED.</p> <p>1. Verify normal indications.</p> <p>a. Indicator H (Calibrate Repeat Power) lamp On.</p> <p>b. 400 cps Power On lamp On.</p> <p>c. Velocity Brake lamp On.</p> <p>d. Displacement Brake lamp On.</p> <p>e. Repeat lamp On (RC).</p> <p>2. Set L bias pot to value obtained from Fire Mission Data Sheet.</p> <p>3. Set M bias pot to value obtained from Fire Mission Data Sheet.</p> <p>4. Dial Position 6 on the Function Selector.</p> <p>Indicator 6 (L) lamp On.</p>	<p>ALL STEPS AND INDICATIONS ARE ON THE LATERAL CONTROL PANEL UNLESS OTHERWISE NOTED.</p> <p>1. Verify normal indications.</p> <p>a. Indicator H (Calibrate Repeat Power) lamp On.</p> <p>b. 400 cps Power On lamp On.</p> <p>c. Velocity Detent meter reads in Black zone.</p> <p>d. Displacement Detent meter reads in Black zone.</p> <p>e. Calibrate Time lamp On (LC).</p> <p>2. Insure Inverter Calibration is within tolerance (IC).</p> <p>3. Reset Calibrator clock (LC).</p>			<p>ALCOHOL LOADING</p> <p>THE ALCOHOL FILLING WEIGHT WILL BE 18,835 POUNDS OF 75.5 <math>\pm 1\%</math> ALC AND WATER. TO DETERMINE THE MINIMUM ALCOHOL TEMPERATURE REQUIRED FOR FIRING, REFER TO THE ENGINE SPECIFIC IMPULSE VALUE CONTAINED IN THE THRUST UNIT LOGBOOK. USING THE ENGINE SPECIFIC IMPULSE AND THE FIRE MISSION RANGE ANGLE OBTAINED FROM FIRE DIRECTION CENTER. IT IS POSSIBLE TO DETERMINE MINIMUM ALCOHOL TEMPERATURE USING THE MINIMUM ALCOHOL TEMPERATURE GRAPH (fig. 2). ACTUAL ALCOHOL TEMPERATURE WILL BE FURNISHED AS FIRE MISSION DATA. TO ELIMINATE THE NEED FOR REHEATING THE TEMP SHOULD BE ABOVE MINIMUM BEFORE FUELING. PRECAUTION WILL BE TAKEN TO PREVENT GENERATION OF SPARKS DURING FUELING OPERATIONS.</p>

Table XIV—Continued

Test station				Firing area		
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					Electrical and pneumatic	Handling and fueling
ALCOHOL LOADING—Continued	VERTICAL CONTROL SYSTEM TEST AND STABILIZER PRE-SETTINGS—Con.  3. Insure that 60 cps voltage switch is On. 60 cps Voltage lamp On (EP). 4. Insure Platform Heater switch is On. 5. Monitor temperature meter. MAXIMUM ALLOWABLE TEMPERATURE IS 58° C. PERIODICALLY OBSERVE TEMPERATURE TO INSURE THAT THE MAXIMUM LIMIT IS NOT EXCEEDED. 6. Turn Gyros switch On. Air Heater lamp cycles. 7. Record the time. 8. Dial Position 3 on the Function Selector. a. Indicator 3 (Earth Rotation Bias X) lamp On. b. Remote Control Null Indicator meter nulls. 9. Depress and hold Bias Fine Push-button.	VERTICAL RANGE COMPUTER TEST—Continued  5. Depress Set pushbutton and release. 6. Depress Adjustment Test pushbutton when Adjustment meter indicates approximately zero. ADJUSTMENT METER MAY NOT INDICATE EXACTLY ZERO FOR SETTING L AND M BIAS BUT TENDS TO HUNT ABOUT ZERO POINT. IF METER INDICATES ON SCALE, THE SETTINGS ARE SATISFACTORY. 7. Release Adjustment Test pushbutton when Adjustment meter indicates Zero. 8. Dial Position 7 on the Function Selector. Indicator 7(M) lamp On. 9. Depress Set pushbutton and release. 10. Depress Adjustment Test push-	VERTICAL LATERAL COMPUTER TEST—Continued  DO NOT PROCEED TO STEP 4 UNTIL STEP 28 OF VERTICAL CONTROL SYSTEMS TEST HAS BEEN COMPLETED. 4. Zero Repeater with Zero adjust knob and hold until clock starts. 5. Depress and momentarily hold start pushbutton before releasing (LC). a. Calibrator clock starts and runs for 100 seconds. b. Buzzer is heard momentarily as Calibrator clock stops. c. Read light will be on momentarily and then go off as Calibrator clock stops. 6. Read Repeater at moment the read light comes on. 7. Compare Repeater reading with value (H) from Fire Mission Data Sheet.	ALCOHOL LOADING—Continued	ALCOHOL LOADING—Continued	ALCOHOL LOADING—Continued  ALL FUEL HANDLING AND RELATED EQUIPMENT MUST BE WELL GROUNDED AND RUBBING OF SURFACES MUST BE PREVENTED.  PRIOR TO OPERATION OF THE ALC TRAILER, INSURE THAT THE TRAILER IS GROUNDED, THAT THE ALC HEATERS IN THE TRAILER ARE ELECTRICALLY DISCONNECTED AND THAT THE HANDWHEEL ON THE ALC FILL AND DRAIN VALVE HAS BEEN TURNED FULLY COUNTERCLOCKWISE.  1. Connect the ALC Hose from the outlet valve on the trailer to the ALC connection on the propellant ladder.  2. Open the ALC trailer manhole cover.  3. Connect ¼ inch outlet hose between the trailer and the fill and outlet connection on the igniter Alcohol bottle. 4. Check rotation of pump. a. Move the meter override switch to On. b. Depress start button, observe that pump rotation is in the direction indicated by the arrow on the motor housing, and then depress stop button. c. After check move the meter override switch Off. 5. Clear the delivery register on the Neptune meter.

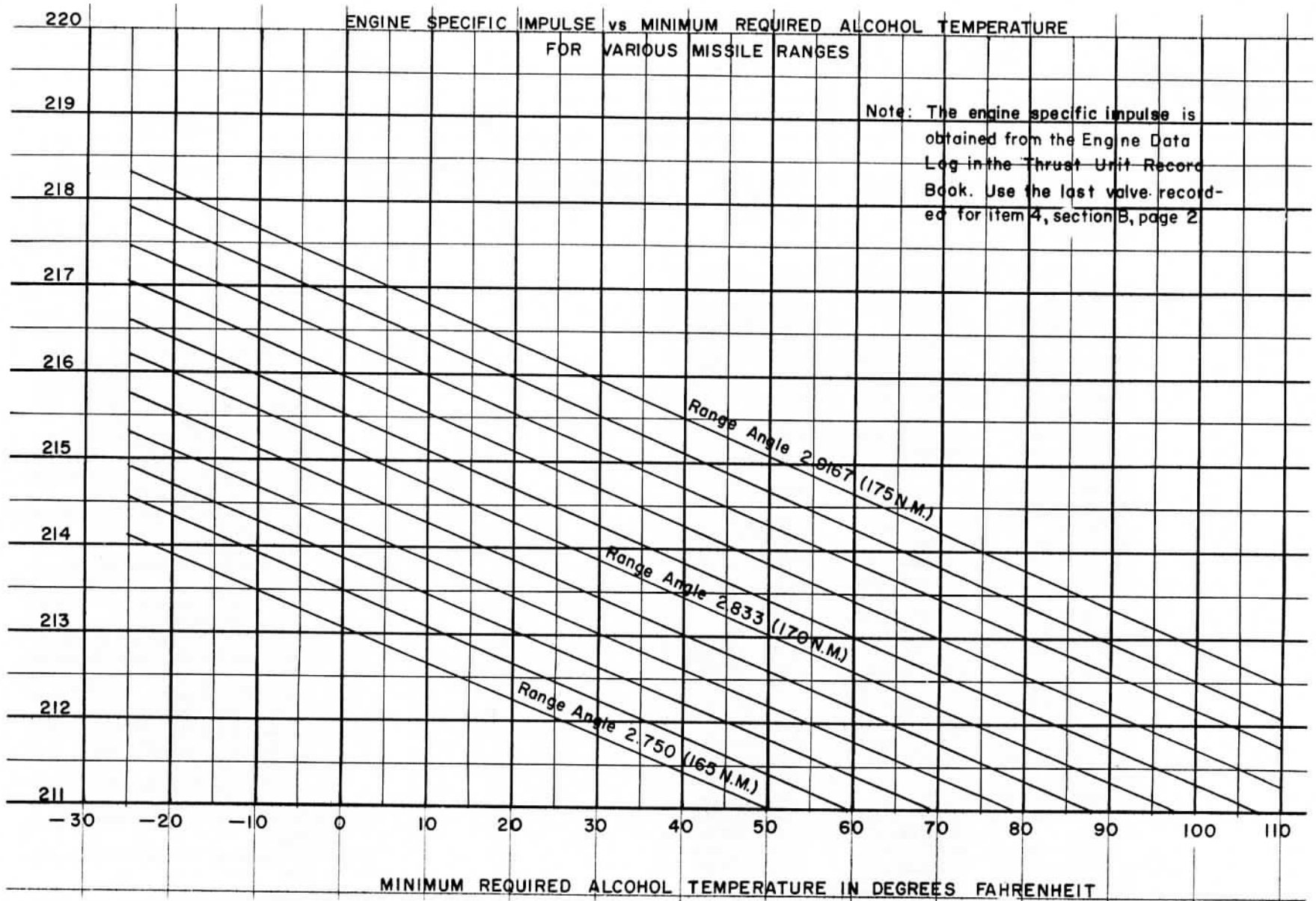


Figure 2.

Table XIV—Continued

Test station				Firing area		
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ALCOHOL LOADING—Continued	<p>VERTICAL CONTROL SYSTEM TEST AND STABILIZER PRE-SETTINGS—Con.</p> <p>Remote Control Null Indicator meter reads on scale.</p> <p>10. Slowly rotate X earth Rotation Bias pot to value obtained from Fire Mission Data Sheet, keeping Remote Control Null Indicator meter on scale.</p> <p>Remote Control Null Indicator meter stabilizes within limits of scale when correct value is set.</p> <p>11. Release Bias Fine pushbutton.</p> <p>12. Dial Position 4 on the Function Selector.</p> <p>a. Indicator 4 (Earth Rotation Bias Y) lamp On.</p> <p>b. Remote Control Null Indicator meter nulls.</p> <p>13. Depress and hold Bias Fine Pushbutton.</p> <p>Remote Control Null Indicator meter reads on scale.</p> <p>14. Slowly rotate Y Earth Rotation Bias pot to value obtained from Fire</p>	<p>VERTICAL RANGE COMPUTER TEST—Continued</p> <p>button when Adjustment meter indicates approximately zero.</p> <p>11. Release Adjustment Test pushbutton when Adjustment meter indicates zero.</p> <p>12. Insure Inverter Calibration is within tolerance (IC).</p> <p>13. Dial Position H on the Function Selector.</p> <p>a. Indicator H (Calibrate Repeat Power) lamp On.</p> <p>b. Repeat lamp On. (RC).</p> <p>Indication C will occur only if ST-80 is uncaged.</p> <p>c. Repeater indicates precession of Range Accelerometer (Clockwise).</p> <p>DO NOT PROCEED TO STEP 14 UNTIL STEP 28 OF VERTICAL CONTROL SYSTEMS TEST IS COMPLETED.</p> <p>14. Depress and release Calibrate pushbutton (RC).</p>	<p>VERTICAL LATERAL COMPUTER TEST—Continued</p> <p>THE TOLERANCE FOR THIS COMPARISON IS OBTAINED FROM FIRE MISSION DATA SHEET, VALUES H+.01, AND H-.01. IF THE COMPARISON FROM STEP 7 IS OUT OF TOLERANCE, HAVE STABILIZER CONSOLE OPERATOR RESET PENDULUM BIAS X TO 450. THEN REPEAT STEPS 3 THROUGH 7. NOTE THE EFFECT ON THE REPEATER READING AND CONTINUE MOVING THE PENDULUM BIAS X POT IN THE APPROPRIATE DIRECTION UNTIL COMPARISON IN STEP 7 IS WITHIN TOLERANCE. INSURE THAT COMPARISON STAYS WITHIN</p>	ALCOHOL LOADING—Continued	ALCOHOL LOADING—Continued	ALCOHOL LOADING—Continued
						<p>6. Determine the number of gallons to be pumped.</p> <p>a. Utilizing the temperature gage located on the ALC trailer, read the temperature of the alcohol.</p> <p>b. Using the alc-o-lator, align the per cent mixture reading on the per cent mixture scale with the temperature reading on the temperature scale.</p> <p>THE CORRECT PERCENT MIXTURE IS FURNISHED THE FUELING CREW BY THE ORDNANCE DIRECT SUPPORT UNIT.</p> <p>c. Obtain the specific gravity of the alcohol on the specific gravity scale opposite the arrow.</p> <p>d. Turn the alc-o-lator over and set the weight of the fuel in pounds on the weight pounds scale opposite the arrow.</p> <p>e. Set the specific gravity value obtained in step c on the specific gravity scale. Opposite this value on the gallons scale are the number of gallons of fuel required for the missile. Add this value to the number that will be retained in the hose and ladder (marked on hose). The total is the number of gallons to be set on the meter.</p> <p>7. Set the Auto-Stop Register to the required number of gallons to be pumped.</p> <p>8. Set valve "B" to normal delivery position.</p> <p>9. Set valve "A" to normal delivery position.</p> <p>10. Open valve "D."</p> <p>11. Open auto-stop valve by turning to the maximum counterclockwise position.</p>

Table XIV—Continued

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ALCOHOL LOADING—Continued	VERTICAL CONTROL SYSTEM TEST AND STABILIZER PRE-SETTINGS—Con.	VERTICAL RANGE COMPUTER TEST—Continued	VERTICAL LATERAL COMPUTER TEST—Continued	ALCOHOL LOADING—Continued	ALCOHOL LOADING—Continued	ALCOHOL LOADING—Continued
12. Periodically monitor ALC temperature on ALC Temperature (PP). Temperature must be at least minimum required temperature. NOTIFY CHIEF OF HANDLING AND FUELING IF TEMPERATURE DROPS BELOW MINIMUM VALUE.	Mission Data Sheet, keeping Remote Control Null Indicator meter on scale. Remote Control Null Indicator meter stabilizes within limits of scale when a correct value is set. 15. Release Bias Fine pushbutton. 16. Dial Position 5 on the Function Selector. a. Indicator 5 (Earth Rotation Bias Z) lamp On. b. Remote Control Null Indicator meter nulls. 17. Depress and hold Bias Fine pushbutton. Remote Control Null Indicator meter reads on scale. 18. Slowly rotate Z Earth Rotation Bias pot to desired value obtained from Fire Mission Data Sheet, keeping Remote Control Null Indicator meter on scale.	a. Repeat lamp Off (RC). b. Calibrate lamp On (RC). IF CLOCK STARTS ALLOW IT TO RUN UNTIL IT STOPS BEFORE STARTING STEP 15. 15. Depress lever on Calibrator clock and hold until Reset lamp comes On then immediately release. a. Pulse light pulses (RC). b. Calibrate clock starts with first pulse (RC). c. Reset lamp goes Off (RC). 16. Monitor the revolutions of the red hand on the calibrator clock in order to compute the total time when the clock stops. 17. Compute the elapsed time when Calibrator clock stops. 18. Compare time computed in Step 18 with time (F) indicated in Fire	TOLERANCE BY MAKING PERIODIC CHECKS UNTIL REMOVAL OF TS, FOLLOWING STEPS 2 THROUGH 7.  END OF TEST  IF FIRING TAPE WAS NOT RECORDED DURING HORIZONTAL TESTS, IT SHOULD BE RECORDED NOW. USE PROCEDURES IN TABLE IV, PROGRAM DEVICE TEST.  WHEN RECORDING IS COMPLETED INSURE THAT CABLE W3802 IS DISCONNECTED FROM TEST STATION AND MISSILE.	ALCOHOL LOADING—Continued	ALCOHOL LOADING—Continued	12. Start pump by depressing start pushbutton. INFORM THE PROPULSION PANEL OPERATOR THE MINIMUM ALCOHOL TEMPERATURE AND REQUEST PROPULSION PANEL OPERATOR TO MONITOR ALC TANK TEMPERATURE UPON COMPLETION OF LOADING OPERATION AND PERIODICALLY THEREAFTER. CHECK TAIL SECTION FOR LEAKS DURING ALCOHOL LOADING FOR PROPELLANT LEAKS.

Table XIV—Continued

Test station				Firing area		
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ALCOHOL LOADING—Continued	VERTICAL CONTROL SYSTEM TEST AND STABILIZER PRE-SETTINGS—Con.  Remote Control Null Indicator meter stabilizes within limits of scale when correct value is set. 19. Release Bias Fine pushbutton. 20. Dial Position 8 on the Function Selector. a. Indicator 8 (Accelerometer Adjust) lamp On. b. Accel Zero lamp On. c. Accel Angle counter reads Zero. IF ACCEL ZERO LAMP IS NOT ON, DEPRESS THE REVERSE PUSHBUTTON UNTIL ACCEL ZERO LAMP COMES ON. DIAL POSITION 8 AGAIN TO ZERO COUNTERS. 21. Depress Forward pushbutton until Accel Angle counter indicates the number of pulses (Item P) on the Fire Mission Data Sheet.	VERTICAL RANGE COMPUTER TEST—Continued  Mission Data Sheet. THE TOLERANCE FOR THIS COMPARISON IS OBTAINED FROM FIRE MISSION DATA SHEET, VALUES F +.01 AND F -.01. IF THE COMPARISON FROM STEP 18 IS OUT OF TOLERANCE, HAVE STABILIZER CONSOLE OPERATOR RESET PENDULUM BIAS Z POT TO 450. THEN REPEAT STEPS 15 THROUGH 18. NOTE THE EFFECT ON TIME AND AND CONTINUE HAVING PENDULUM BIAS Z POT RESET IN THE APPROPRIATE DIRECTION UNTIL COMPARISON IN STEP 18 IS WITHIN TOLERANCE.		ALCOHOL LOADING—Continued	ALCOHOL LOADING—Continued  13. Upon completion of Alcohol Loading in the missile, turn ALC bubbling switch On (VB). IF NETWORKS VOLTAGE IS REMOVED FROM VALVE BOX AFTER ALCOHOL LOADING IS COMPLETED OPEN ALC BUBBLING BY-PASS VALVE. CLOSE ALC BUBBLING BY-PASS VALVE WHEN NETWORKS VOLTAGE IS RESTORED.  14. Fill Igniter ALC bottle. a. Move the meter drain and sample line valve to the sample position on ALC Trailer. Valve is located underneath meter autostop valve. The igniter ALC container can be filled by gravity or during pumping operations. b. When overflow at the pressurizing connector occurs turn valve off. 15. Remove and stow the fill and drain line to igniter ALC bottle after the container has been filled. 16. Replace flow line between igniter ALC bottle and valve box. 17. Drain the transfer hoses.	ALCOHOL LOADING—Continued  13. Pump will stop when required number gallons have been pumped.



Table XIV—Continued

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ALCOHOL LOADING—Continued	VERTICAL CONTROL SYSTEM TEST AND STABILIZER PRE-SETTINGS—Con.  Accel Zero lamp Off. IF HIGHER NUMBER OF PULSES ARE INDICATED ON ACCEL ANGLE COUNTER THAN DESIRED, DEPRESS REVERSE PUSH-BUTTON UNTIL ZERO LAMP COMES ON, THEN REPEAT STEPS 20 AND 21. 22. Turn Ampl switch On. 23. Turn Erect switch On. DO NOT PROCEED TO STEP 24 UNLESS 6 MINUTES HAVE ELAPSED SINCE TURNING THE GYROS ON. 24. Dial Position 10 on the Function Selector. a. Indicator 10 (Caging) lamp On.	VERTICAL RANGE COMPUTER TEST—Continued  19. Depress and release Repeat pushbutton (RC). a. Calibrate lamp Off (RC). b. Repeat lamp On (RC). INSURE THAT COMPARISON STAYS WITHIN TOLERANCE BY MAKING PERIODIC CHECKS, FOLLOWING STEPS 12 THRU 19, UNTIL REMOVAL OF TEST STATION.  END OF TEST		ALCOHOL LOADING—Continued	ALCOHOL LOADING—Continued	ALCOHOL LOADING—Continued  INSURE THAT THE HANDWHEEL ON THE ALC FILL AND DRAIN VALVE IS FULLY COUNTERCLOCKWISE. a. Disconnect the ALC fill and drain valve from missile. Replace cover on ALC fill valve on missile. b. Set valve B to evacuate position. c. Set valve A to evacuate position. d. Check that valve D is open. e. Move meter override switch to On. f. Start pump. 18. Observe flow of ALC in sight glass. After ALC sight glass shows no ALC flow, wait approximately 30 seconds for remaining ALC surges. Stop pump. 19. Set valve A to recirculate position. 20. Disconnect power cable and transfer hoses. 21. Close ALC trailer manhole cover—close valve D. 22. Disconnect ground wire. 23. Move out of area. THE FUELING CHIEF WILL BE NOTIFIED IF THE TEMPERATURE DROPS BELOW THE REQUIRED MINIMUM TEMP BY THE PROPULSION PANEL OPERATOR. WHEN NOTIFIED THAT SUCH A CONDITION EXISTS, THE FUELING CHIEF WILL RECYCLE THE ALC THROUGH THE ALC TRAILER TO REHEAT. REFER TO TABLE XXI FOR DRAINING PROCEDURE.
END OF ALCOHOL LOADING				END OF ALCOHOL LOADING	END OF ALCOHOL LOADING	END OF ALCOHOL LOADING

Table XIV—Continued

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	<p>VERTICAL CONTROL SYSTEM TEST AND STABILIZER PRE-SETTINGS—Con.</p> <p>b. Caged lamp On.</p> <p>25. Operate Caging switch to the Uncaged position and hold until Uncaged lamp lights.</p> <p>a. Caged lamp Off immediately upon operating Caging switch to Uncaged position.</p> <p>b. Uncaged lamp On after approximately 1 minute delay.</p> <p>26. Dial Position H on the Function Selector.</p> <p>a. Indicator H (Attitude Signals) lamp On.</p> <p>b. Attitude meters indicate some deflection, but should move towards Zero.</p> <p>27. Turn Fine switch On when Attitude meters indicate <math>0 \pm 1.5^\circ</math>.</p> <p>THE SENSITIVITY OF THE ATTITUDE METERS IS INCREASED BY 10 WHEN THE FINE SWITCH IS ON.</p>			<p>LOX LOADING</p> <p>1. Turn on Main LOX valve heater switch at heater control box.</p>		<p>LOX LOADING</p> <p>INSURE THAT HANDWHEEL ON LOX FILL AND DRAIN VALVE HAS BEEN TURNED FULLY COUNTERCLOCKWISE.</p> <p>INSPECT TAIL SECTION DURING LOX LOADING FOR PROPELLANT LEAKS.</p> <p>1. Position Herman Nelson Heater approximately <math>50^\circ</math> from missile and start in accordance with instruction contained on the heater. Do not apply heat to the tail section at this time.</p> <p>2. Position 2 LOX trailers. The trailers will arrive at firing position with all valves closed except Valves #14 and #28.</p> <p>3. Ground both trailers.</p> <p>4. Prepare trailers for LOX loading.</p> <p>a. Close Valve No. 14 on both trailers (blowdown valve).</p> <p>b. Connect (2½ inch) LOX transfer hose between trailer and Y-connector (both trailers). Insure that valve No. 28 is open.</p> <p>c. Open Valve No. 27 on both trailers (pressure building pump suction valve).</p> <p>d. Connect power cables between trailers and AC distribution box (both trailers).</p> <p>e. Start blower on vaporizer (both trailers, if so equipped).</p> <p>f. Check that pump rotation (both trailers) coincides with arrow on volute case.</p> <p>g. Insure that missile LOX vent valve is open.</p>



Table XIV—Continued

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	VERTICAL CONTROL SYSTEM TEST AND STABILIZER PRE-SETTINGS—Con.  28. Turn correction switch On when Attitude meters approach zero. ATTITUDE SIGNALS METERS APPROACH ZERO AND STABILIZE, BUT STABILIZATION WILL NOT NECESSARILY OCCUR AT ZERO POSITION ON THE METERS. 29. Insure that the Control Computer switch is On (SP). 30. Turn Rudder Drive switch On (SP). 31. Turn Fine switch Off. 32. Depress the ST-80 Comd Test pushbutton. a. Yaw and Roll Attitude Signals meters deflect approximately 3° in the negative direction from their stabilized position.			LOX LOADING—Continued		LOX LOADING—Continued  5. Precool. a. Insure that pressure in both trailers has reached 18 to 20 psi. b. Partially open valve No. 10 (pump suction valve in both trailers). c. Maintain pressure in trailers at 25 to 28 psi by throttling valve No. 27 (pressure building pump suction valve). d. Precooling will be accomplished in 4 to 8 minutes. 6. Pump LOX into missile. a. Close Valve No. 10 (pump suction valve) in trailer No. 1. b. Open wide valve No. 10 in trailer No. 2 and start pump. Trailer pressure is maintained at 25 to 28 psi by throttling valve No. 26. c. Permit trailer No. 2 to pump 3 to 5 minutes, then open wide valve No. 10 in trailer No. 1 and start the pump. d. Both trailers pump simultaneously until trailer No. 2 is empty. Secure trailer No. 2 by stopping the pump motor, closing valves No. 10, 26 and 27, and open valve No. 14. Trailer No. 1 continues until missile tank overflows through LOX vent conduit. INSURE THAT HANDWHEEL ON LOX FILL AND DRAIN VALVE IS FULLY COUNTERCLOCKWISE. e. Secure trailer No. 1 by stopping pump motor and closing valves No. 10, 26, and 27. f. Open drain valve on Y-connector. g. After draining LOX transfer hoses, disconnect (2½ inch) hoses between Y-connector and LOX trailers. h. Disconnect ground wires.

Table XIV—Continued

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LOX REPLENISHING	VERTICAL CONTROL SYSTEM TEST AND STABILIZER PRE-SETTINGS—Con.			LOX LOADING—Continued		LOX LOADING—Continued
	<p>b. Pitch Attitude Signal meter deflects approximately 3° in the positive direction from its stabilized position.</p> <p>c. Vane I and IV meters indicate positive (SP).</p> <p>d. Vanes II and III meters indicate negative (SP).</p> <p>33. Release the ST-80 Comd Test pushbutton.</p> <p>a. Yaw, Roll and Pitch Attitude Signals meters return to their Stabilized Position (not necessarily at Zero).</p> <p>b. Vane meters return to Zero (SP).</p> <p>VANE POSITION METERS ON STEERING PANEL MAY NOT INDICATE EXACT ZERO AT THIS TIME.</p> <p>34. Turn rudder drive switch Off (SP).</p> <p>IF POWER TRANSFER</p>		END OF LOX LOADING	LOX REPLENISHING	<p>i. Pull trailer No. 2 out of area. Pull trailer No. 1 (still pressurized) to replenishing position.</p> <p>7. Inspect the tail section for fuel leaks and torque the turbine.</p> <p>MAXIMUM TORQUE MUST NOT EXCEED 75 INCH-POUNDS BREAK AWAY AND 25 INCH-POUNDS RUNNING. MONITOR TURBINE TORQUE PERIODICALLY.</p> <p>8. Disconnect and remove LOX transfer line and LOX fill and drain valve.</p> <p>9. Disengage hooks holding vent conduit to missile. Do not remove conduit.</p> <p>10. After the turbine has been torqued and tail section has been checked for leaks, turn Herman Nelson heater control to full heat and open vent lever.</p> <p>INSTRUCTIONS FOR OPERATING HERMAN NELSON HEATER ARE INCLUDED WITH THE HEATER.</p> <p>END OF LOX LOADING</p> <p>LOX REPLENISHING</p> <p>1. Position the replenishing trailer approximately 150 feet from the missile.</p> <p>2. Connect and tighten replenishing valve to discharge port on trailer and connect ground wire.</p> <p>3. Connect and tighten replenishing hose to the replenishing valve on trailer.</p> <p>4. Notify Chief of Electrical and Pneumatic crew that equipment is ready for pneumatic connection between air servicer and LOX trailer.</p>	
					4. Connect air hose between replenishing valve on LOX trailer and 750 psi discharge port on air servicer.	

Table XIV—Continued

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<p>LOX REPLENISHING—Continued</p> <p>6. When notified that Replenishing trailer is ready—</p> <ol style="list-style-type: none"> <li>Record the time.</li> <li>Replenish missile approximately every 15 minutes by placing the replenish switch to the fill position. When missile fills, return switch to center position.</li> <li>To prevent the replenishing valve from freezing, cycle the LOX replenish switch every 4-5 minutes until missile is fired (TS or RF).</li> </ol> <p>NOTIFY PERSONNEL AT MISSILE WHENEVER REPLENISHING OPERATION IS PERFORMED.</p> <p>END OF LOX REPLENISHING</p>	<p>VERTICAL CONTROL SYSTEM TEST AND STABILIZER PRE-SETTINGS—Con.</p> <p>TEST WAS NOT PERFORMED DURING HORIZONTAL TESTS, IT SHOULD BE PERFORMED BEFORE PROCEEDING TO STEP 35.</p> <p>ANNOUNCE TO ALL STATIONS INVOLVED IN POWER TRANSFER TEST, THAT TABLE IX, STEPS 15 THROUGH 19 WILL BE USED AS A GUIDE.</p> <p>35. Dial position 2 on the Function Selector.</p> <ol style="list-style-type: none"> <li>Indicator 2 (Program Test) lamp On.</li> <li>Tilt Program counter reads Zero.</li> </ol> <p>36. Depress Forward pushbutton and hold.</p> <ol style="list-style-type: none"> <li>Program Zero lamp Off.</li> <li>Tilt Program counter stops after approximately 4 counts.</li> </ol>				<p>LOX REPLENISHING—Continued</p> <p>5. After pneumatic connection is made, open valves No. 11 and 27 and close valve No. 28.</p> <ol style="list-style-type: none"> <li>The automatic pressure regulating valve should maintain 29 psi <math>\pm</math> 2 psi in the LOX trailer.</li> <li>Observe trailer pressure to insure that automatic pressure regulating valve is operating.</li> <li>Notify Propulsion Panel Operator that LOX Replenishing trailer is ready for operation.</li> </ol> <p>END OF LOX REPLENISHING</p>

Table XIV—Continued

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Propulsion and electrical console	Stabilizer and steering console	Range console	Lateral and program console	Firing section	Servicing section	
					Electrical and pneumatic	Handling and fueling
H <sub>2</sub> O <sub>2</sub> LOADING	<p>VERTICAL CONTROL SYSTEM TEST AND STABILIZER PRE-SETTINGS—Con.</p> <p>37. Turn 4° Bypass On and hold until counter indicates 6 to 10 counts then release Forward pushbutton.</p> <p>38. Release 4° Bypass switch.</p> <p>39. Dial Position H on the Function Selector.</p> <p>a. Indicator H (Attitude Signals) lamp On.</p> <p>b. Pitch Attitude Signals meter indicates 6° to 10° in the negative direction from the stabilized position.</p> <p>40. Dial Position 2 on the Function Selector.</p> <p>a. Indicator 2 (Program Test) lamp On.</p> <p>b. Tilt Program counter zeroes.</p> <p>41. Depress Reverse pushbutton and hold until Program Zero lamp comes On.</p> <p>a. Program Zero lamp On.</p> <p>b. Tilt Program Counter reads 6 to 10 counts.*</p>			<p>H<sub>2</sub>O<sub>2</sub> LOADING</p> <p>1. Turn the following switches on (HB):</p> <p>a. H<sub>2</sub>O<sub>2</sub> overflow tubing and valve switch (HB).</p> <p>b. H<sub>2</sub>O<sub>2</sub> fill and drain lines, servo and shutoff valves switch (HB).</p> <p>c. H<sub>2</sub>O<sub>2</sub> tank switch (HB).</p> <p>Power On lamps On (HB).</p>		<p>H<sub>2</sub>O<sub>2</sub> LOADING</p> <p>ANY H<sub>2</sub>O<sub>2</sub> THAT IS SPILLED MUST BE FLUSHED IMMEDIATELY WITH WATER. H<sub>2</sub>O<sub>2</sub> CREW MUST WEAR PROTECTIVE CLOTHING.</p> <p>1. Undo fasteners and roll truck tarpaulin forward to allow access to equipment.</p> <p>2. Position H<sub>2</sub>O<sub>2</sub> truck within 20 to 30 feet of H<sub>2</sub>O<sub>2</sub> fill and drain valve on missile and electrically ground the truck.</p> <p>3. Connect electrical power cable between AC distribution box and H<sub>2</sub>O<sub>2</sub> pump motor.</p> <p>4. Recirculate then check H<sub>2</sub>O<sub>2</sub> temperature to insure it is 75° ± 10° F.</p> <p>5. Position and connect H<sub>2</sub>O<sub>2</sub> overflow tank half full of de-mineralized water to missile H<sub>2</sub>O<sub>2</sub> overflow line.</p> <p>6. Connect discharge hose between missile fill and drain valve and H<sub>2</sub>O<sub>2</sub> pump.</p> <p>7. Depress start button on pump switch, then immediately depress stop button. Rotation should conform to arrow on pump housing.</p>

Table XIV—Continued

Test station				Firing area		
Propulsion and electrical console	Stabilizer and steering console	Range console	Lateral and program console	Firing section	Servicing section	
					Electrical and pneumatic	Handling and fueling
H <sub>2</sub> O <sub>2</sub> LOADING—Continued	VERTICAL CONTROL SYSTEM TEST AND STABILIZER PRE-SETTINGS—Con.					H <sub>2</sub> O <sub>2</sub> LOADING—Continued
9. Monitor H <sub>2</sub> O <sub>2</sub> temperature on H <sub>2</sub> O <sub>2</sub> temperature meter (PP). TEMPERATURE MUST REMAIN BETWEEN 65° AND 85° F. REPORT DISCREPANCIES TO FUELING CHIEF IMMEDIATELY.	42. Dial Position 2 on Function Selector. a. Indicator 2 (Program Test) lamp On. b. Tilt Program counter zeroes. 43. Turn Fine switch On. 44. Dial Position H on the Function Selector. a. Indicator H (Attitude Signals) lamps On. b. Pitch Attitude Signal meters indicate their stabilized positions. INSURE THAT THE ST-80 REMAINS STABILIZED AND ITS TEMPERATURE IS WITHIN LIMITS BY MONITORING PERIODICALLY.					INSPECT TAIL SECTION DURING H <sub>2</sub> O <sub>2</sub> LOADING FOR PROPELLANT LEAKS. 8. Transfer H <sub>2</sub> O <sub>2</sub> from drum to missile tank. a. Depress start button on pump motor switch. b. Allow pump to operate until H <sub>2</sub> O <sub>2</sub> missile tank is full and overflows into H <sub>2</sub> O <sub>2</sub> overflow tank. c. Depress stop button on pump motor switch. 9. Have propulsion panel operator observe H <sub>2</sub> O <sub>2</sub> temperature during and after operation. Propulsion panel operator will report temperature readings above 85° and below 65° F. to fueling chief. 10. Disconnect discharge hose from missile and connect to return fitting on drum. DO NOT DISCONNECT ANY OTHER HOSES. H <sub>2</sub> O <sub>2</sub> TRUCK WILL RETURN TO THE FIRING POSITION AND PICK UP THE OVERFLOW TANK WHEN THE TEST STATION LEAVES. WHEN OVERFLOW LINE IS DISCONNECTED REMOVE CAP FROM T CONNECTION. 11. Disconnect power cable. 12. Remove ground wire. 13. Drive truck from area. 14. Remove propellant loading ladder from missile.
END OF H <sub>2</sub> O <sub>2</sub> LOADING	END OF TEST			END OF H <sub>2</sub> O <sub>2</sub> LOADING		
END OF TABLE XIV	END OF TABLE XIV	END OF TABLE XIV	END OF TABLE XIV	END OF TABLE XIV	END OF TABLE XIV	END OF H <sub>2</sub> O <sub>2</sub> LOADING END OF TABLE XIV

Table XV

Firing area		
Test station—stabilizer and steering console	Servicing section	
	Handling and fueling	
PRECISE MISSILE LEVELING	PRECISE MISSILE LEVELING	FINAL LAYING
1. a. Turn Fine switch On (SC). b. Monitor Yaw Attitude Signals meter (SC).	1. Inform steering and stabilizer console operator that precise missile leveling is to be started.	FINAL LAYING IS STARTED WHEN THE MISSILE HAS BEEN PRECISELY LEVELED. Lay the missile on the firing azimuth.
2. Inform Handling and Fueling Chief the Direction in which missile yaw axis must be corrected.	2. Slowly adjust the 2 appropriate launcher legs in the proper directions to give the result required.	INSURE THAT MISSILE IS LAID WITHIN $\pm 20$ MINUTES OF THE REQUIRED FIRING AZIMUTH BEFORE ALLOWING PERSONNEL TO PROCEED WITH TABLE XVI.
A PLUS SIGNAL INDICATES THAT NUMBER II FIN IS HIGH. INFORM THE HANDLING CHIEF OF THE APPROPRIATE CORRECTION FOR THE EXISTENT ERROR.		FINAL LAYING MUST BE COMPLETED PRIOR TO COMPLETION OF TABLE XVII.
3. Inform Handling and Fueling Chief when yaw attitude signals meter indicates zero (SC).		FOR COMPLETE DETAILS ON MISSILE LAYING PROCEDURES, REFER TO FM 6-35.
MISSILE LEVELING USING THE ALINEMENT ROD PENDULUM WILL CAUSE THE PITCH ATTITUDES METER TO MOVE TO A NEW STABILIZED POSITION. MISSILE ROTATION DURING LAYING WILL CAUSE THE ROLL ATTITUDES METER TO MOVE TO A NEW POSITION AND THEN SLOWLY RETURN TO THE PREVIOUS STABILIZED POSITION.	4. Monitor Alinement Rod Pendulum Meter (RB). NEEDLE DEFLECTION RIGHT INDICATES NUMBER I FIN IS HIGH.	
	5. Slowly adjust the two appropriate legs in the proper direction until the alinement pendulum meter zeroes. DEPRESS PENDULUM LEVEL PUSH BUTTON WHEN METER INDICATES APPROXIMATELY ZERO. Meter needle may oscillate about zero.	
END OF TABLE XV	6. Repeat steps 2 and 5 until both conditions are satisfied. END OF TABLE XV	END OF TABLE XV



Table XVI

Test station		
Propulsion and electrical console	Range console	Lateral and program console
RANGE COMPUTER PRESETTING	RANGE COMPUTER PRESETTING	RANGE COMPUTER PRESETTING
BEFORE STARTING PRESETTINGS, THE MISSILE MUST BE LAYED WITHIN 20 MINUTES OF THE FIRING AZIMUTH. ALSO INSURE THAT ST-80 TEMPERATURE IS ABOVE 20° CENTIGRADE		
	ALL STEPS AND INDICATIONS ARE ON THE RANGE CONTROL PANEL UNLESS OTHERWISE NOTED.	ALL STEPS AND INDICATIONS ARE ON THE LATERAL CONTROL PANEL UNLESS OTHERWISE NOTED.
	1. Verify normal indications. a. Indicator H (Calibrate Repeat Power) lamp On. b. Velocity Brake lamp On. c. Displacement Brake lamp On. d. 400 cps Power On lamp On. e. Repeater precessing clockwise. f. Repeat lamp On (RC).	1. Verify normal indications. a. Indicator H (Calibrate Repeat Power) lamp On. b. Velocity Detent meter reads in black zone. c. Displacement Detent meter reads in black zone. d. 400 cps Power On lamp On. e. Repeater precessing. Precessing direction is determined from Fire Mission Data Sheet; Negative H indicates counterclockwise; Positive H clockwise. f. Calibration Time lamp On (LC).
2. Depress Guidance Voltage Reset pushbutton (EP). Guidance Voltage failure lamp Off (EP).	2. Insure that Range computer is Zeroed.	2. Insure that Lateral Computer is Zeroed.
	3. Zero Velocity Preset Timer. ZERO TIMER FROM RIGHT TO LEFT TURNING DIALS COUNTERCLOCKWISE.	3. Zero Displacement Preset Timer. ZERO TIMER FROM RIGHT TO LEFT TURNING DIALS COUNTERCLOCKWISE.
	4. Turn Power switch On (VT). a. Timer motor energized (VT). b. Reset lamp On (VT).	4. Turn Power switch On (DT). a. Timer motors energized (DT). b. Reset lamp On (DT).
	5. Dial Position 1 on the Function Selector. a. Indicator 1 (Preset) lamp On. b. Repeat lamp Off (RC).	
	6. Depress Preset pushbutton (RC). a. Preset lamp On (RC). b. Velocity lamp On (RC). c. Velocity counter zeroes (RC). d. Displacement counter zeroed (RC).	6. a. Calibration Time lamp Off (LC). b. Displacement Time Lamp On (LC).
	7. Set Velocity Preset Timer to exact value obtained from item (i) on Fire Mission Data Sheet. SET TIMER FROM LEFT TO RIGHT TURNING DIALS CLOCKWISE.	7. Set Displacement Preset Timer to exact value obtained from item (j) on Fire Mission Data Sheet. SET TIMER FROM LEFT TO RIGHT TURNING DIALS CLOCKWISE.

Table XVI—Continued

Test station		
Propulsion and electrical console	Range console	Lateral and program console
RANGE COMPUTER PRESETTING—Continued	RANGE COMPUTER PRESETTING—Continued	RANGE COMPUTER PRESETTING—Continued
	8. Reset Calibrator clock (RC).	8. Reset Calibrator clock (LC).
9. Guidance Voltage Failure lamp blinks (EP).	9. Depress Timer Start pushbutton. a. Velocity Preset Timer starts (VT) (dials move toward zero). b. Velocity Brake light Off. c. Displacement Brake light Off. d. Calibrator clock starts (RC). e. Velocity Monitor counter and meter indicate after a short delay (RC). ONE COUNT ON VELOCITY MONITOR COUNTER EQUALS 10 METERS PER SECOND. f. Displacement Monitor counter and meter indicate after a short delay (RC). ONE COUNT OF DISPLACEMENT MONITOR COUNTER EQUALS 1,000 METERS.	9. a. Displacement Preset Timer starts (DT) (dials move toward zero). b. Calibrator clock starts (LC).
	THE FOLLOWING INDICATIONS SHOULD OCCUR AFTER BOTH PRESET TIMERS HAVE STOPPED:	
	a. Velocity Brake light On. b. Displacement Brake light On. c. Calibrator clock stopped (RC). d. Reset lamp On (VT).	a. Calibrator clock stopped (LC). b. Reset lamp On (DT).
	10. Compare time on Calibrator clock to value set on Velocity Preset Timer in Step 7. Time must agree within 5 milliseconds.	10. Compare time on Calibrator clock to value set on Displacement Preset Timer in Step 7. Time must agree within 5 milliseconds.
	11. Algebraically add the Velocity meter to the respective monitoring counter (RC). (Counter is always a Negative value.)	11. Algebraically add the Displacement meter to the respective monitoring counter (LC). (Counter is always a Positive value.)
	12. Compare velocity value obtained in Step 11 to Item Q on the Fire Mission Data Sheet. THIS COMPARISON MUST AGREE WITHIN $\pm 1$ METER PER SECOND.	12. Compare Displacement value obtained in Step 11 to Item S on Fire Mission Data Sheet. THIS COMPARISON MUST AGREE WITHIN $\pm 175$ METERS.
	13. Turn Power switch Off (VT).	13. Turn Power switch Off (DT).
	14. Reset Calibrator clock (RC).	14. Reset Calibrator clock (LC).

Table XVI—Continued

Test station		
Propulsion and electrical console	Range console	Lateral and program console
RANGE COMPUTER PRESETTING—Continued	RANGE COMPUTER PRESETTING—Continued  15. Dial Position H on the Function Selector. a. Indicator H (Calibrate Repeat Power) lamp On. b. Preset lamp Off (RC). c. Repeat lamp On (RC). d. Repeater precessing clockwise (RP). UNDER NO CIRCUMSTANCES WILL THE VELOCITY OR DISPLACEMENT BRAKE PUSH-BUTTONS BE DEPRESSED AFTER PRESETTINGS ARE COMPLETED.	RANGE COMPUTER PRESETTING—Continued  15. a. Displacement Time lamp Off (LC). b. Calibration Time lamp On (LC).  UNDER NO CIRCUMSTANCES WILL THE VELOCITY OR DISPLACEMENT DETENT PUSH-BUTTONS BE DEPRESSED AFTER PRESETTINGS ARE COMPLETED.
16. Depress Guidance Voltage Failure Reset pushbutton (EP). Guidance voltage failure lamp Off (EP). IF GUIDANCE VOLTAGE FAILURE LAMP COMES ON AFTER PRESETTINGS ARE COMPLETED, THE RANGE COMPUTER MUST BE PRESET AGAIN FOLLOWING STEPS 1 THROUGH 16. END OF TEST  END OF TABLE XVI	END OF TEST  END OF TABLE XVI	END OF TEST  END OF TABLE XVI

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